Problem-Based Enhanced Language Learning

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Objectives

By the end of this session, we will …

Know: The key components of a PBELL experience.

Understand: How to enhance problem-based learning by providing opportunities for student-to-student interaction using discipline-specific language.

Be Able To: Connect the new learning to our individual contexts.

Problem-Based Enhanced Language Learning PBELL

Mission: Prepare educators to teach culturally and linguistically diverse learners.

Our Work: PBELL is intentionally planning meaningful problem-based lessons that also build high-level discipline specific language.

Today you will experience a PBELL lesson. A problem-based learning experience that was intentionally designed to provide ELL students with opportunities to engage with discipline-specific language.

PBELL Components

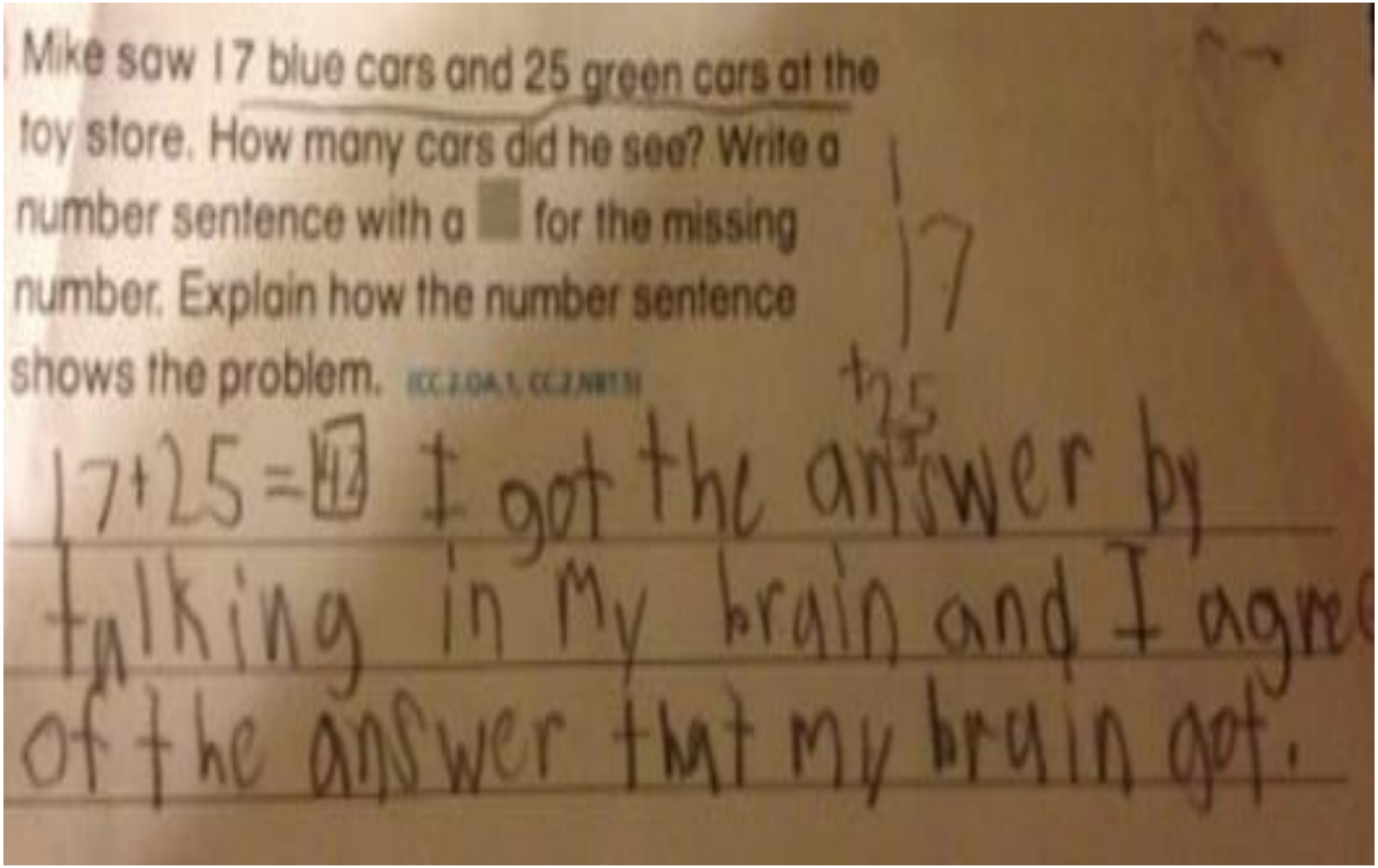
1. Meaningful Problem
2. Problem First
3. Solution Seeking
4. Collaborative Work
5. Solution Sharing
6. Student Centered
7. Problem Guides the Learning Approach
8. Focused Outcomes
9. Evaluation

What makes PBELL different than PBL!
Standards have changed.

Language demands have changed.

Teaching & Learning must change too.

Student Responses



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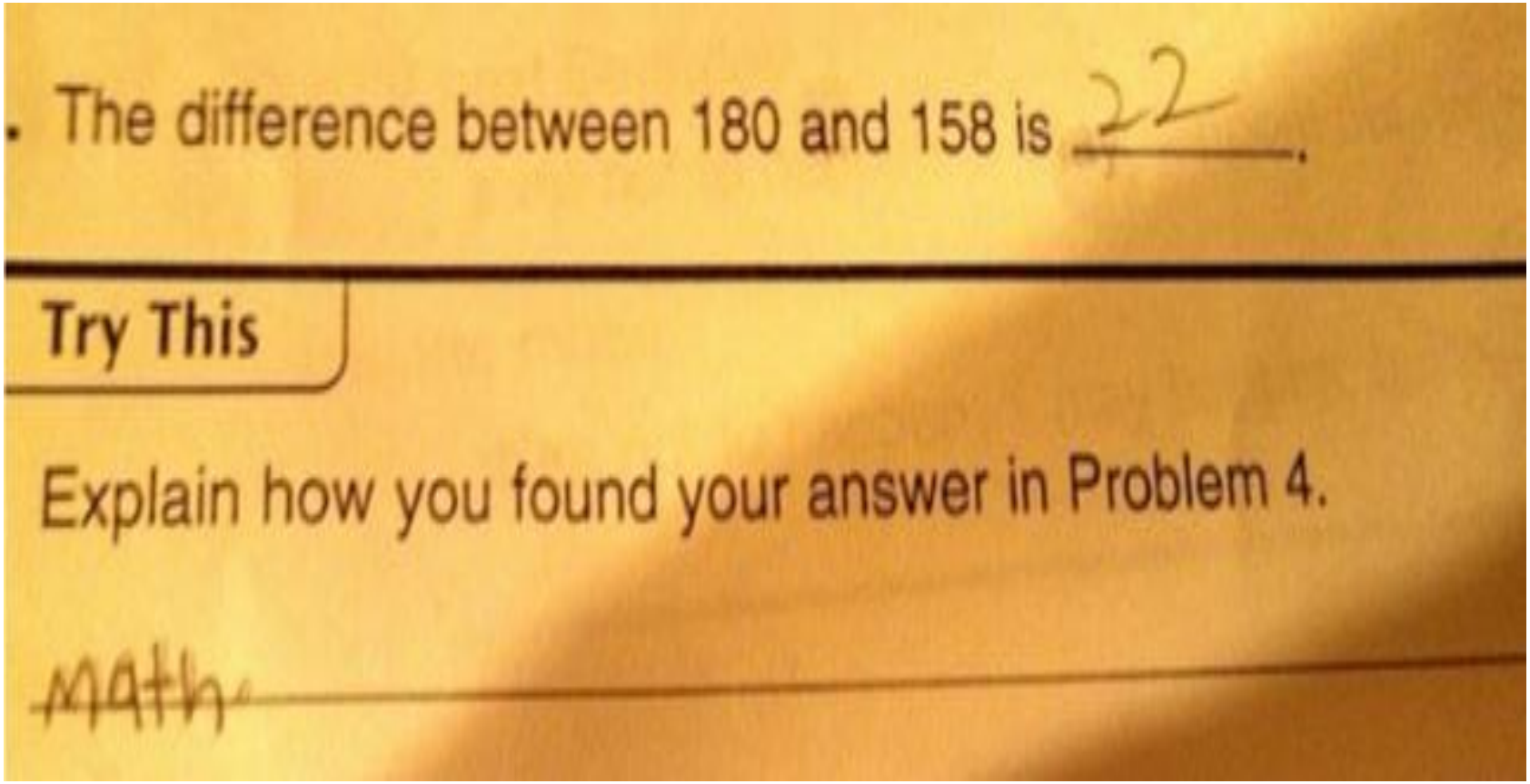

PBELL Experience

Grade Level: 5th grade **Content:** Math

Standard(s):

- 5.NF.B.6. Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.
- CCSS.ELA-LITERACY.SL.5.1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher led) with diverse partners on grade 5 topics and texts, building on others' ideas and expressing their own clearly.
- CCSS.ELA-LITERACY.SL.5.1.D. Review the key ideas expressed and draw conclusions in light of information and knowledge gained from the discussions.
- CCSS.ELA-LITERACY.SL.5.6. Adapt speech to a variety of contexts and tasks, using formal English when appropriate to task and situation. (See grade 5 Language standards 1 and 3 here for specific expectations.)

Problem: How can our class determine if we have enough ingredients to serve lemonade to 72 customers?

Language Function: Language of Justification

PBELL Experience

The Problem

- What problem will students solve?
- How is the problem introduced?
- What standards were used to guide the planning and assessment?

The Experience

- How did students develop solutions?
- What structures did they use to work together?
- How did they present their solutions to their classmates or a public audience?

The Evaluation

- How were the objectives informally assessed?
- How were the objectives formally assessed?

iTeach ELLs Lemonade Stand

Lemonade Stand

Content Language Objective:

Students will justify whether there are enough ingredients for a lemonade stand by multiplying fractions using visual modeling, a graphic organizer, and a cooperative group structure for conversation.

Justification

Students use the **language of justification** to give reasons for an action, decision, point of view, or to convince others.

Looks Like	Sounds Like

Justification

Number Talk

- 5 X 8
- 42 / 6

Justify your answer using one of the following sentence starters:

- I believe ____ is the answer because …
- My primary reason for thinking ____ is the answer is …

Review of Vocabulary

- Fraction
- Whole Number
- Mixed Number
- Visual Model
- Multiply/Multiplication

Lemonade Stand

Lemonade Stand

Sugar

Lemon Juice

Cold Water

Meaningful Problem

With the upcoming Fall Festival, the 5th grade is responsible for running a lemonade stand that sells cold drinks and snacks. In our last lesson, we estimated that our lemonade stand would have a total of 150 customers per day, with 72 buying lemonade. I already have some ingredients for lemonade, but I don't know if I've bought enough.

How can our class determine if we have enough ingredients to serve lemonade to 72 customers?

Meaningful Problem

How can our class determine if we have enough ingredients to serve lemonade to 72 customers?

Ingredients Purchased	12 servings of lemonade (1 pitcher)
10 cups sugar	1 ½ cups sugar
40 cups cold water	6 ¾ cups cold water
9 cups lemon juice	1 1/3 cups lemon juice

If it takes these ingredients to make 12 servings of lemonade, do I have enough ingredients to make the amount I need to serve 72 lemonades?

Conversation Guide

Math Conversation Guide

With the upcoming Fall Festival, the 5th grade is responsible for running a lemonade stand that sells cold drinks and snacks. In our last lesson, we estimated that our lemonade stand would have a total of 150 customers per day, with 72 buying lemonade. I already have some ingredients for lemonade, but I don't know if I've bought enough.
How can our class determine if we have enough ingredients to serve lemonade to 72 customers?

Ingredients for lemonade:	12 servings of lemonade (or 1 pitcher):
10 c sugar	1 ½ c sugar
40 c cold water	6 ¾ c cold water
9 c lemon juice	1 1/3 c lemon juice

Paraphrase and clarify problem for one another

(Talk about what is asked; what is given; what happens; what the units are, etc.)

Materials

- **Cuisenaire Rods**
- **Graph Paper**
- **Pencil**
- **Colored Pencils**

Which of these fraction models would make the most sense to use to solve the problem? Why?

Solution Seeking

Using the **language of justification**, discuss which visual model(s) you think will work best to help you use a strategy that you understand.

Come to agreement about which model(s) you will use and record on the math conversation guide.

Language of Justification:

- I believe this model works best because...
- My primary reason for thinking so is...
- Perhaps the most convincing reason for this is...

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Solution Sharing

Be prepared to share the strategy you used to help solve the problem using the **language of justification.**

Language of Justification:

- I believe this model works best because...
- My primary reason for thinking so is...
- Perhaps the most convincing reason for this is...

Stand Up-Hand Up-Pair Up

Each student will share out their response to the question below.

Yes/No, there is (is not) enough of each ingredient to make the **lemonade.**

Our group knows this because we…(detailed description of visual model used and how/why it was used to determine if there was enough of each ingredient).

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High Level Language

PBELL is intentionally planning meaningful **problem-based lessons** that also build **high-level discipline specific language**.

- How did the specific instruction on the language of justification support the learner in this lesson?
- Why is that important?

Additional Materials

http://www-k6.thinkcentral.com/content/hsp/math/hspmath/na/common/itools_int_9780547584997_/main.html?module=fractions&activity=

http://nrich.maths.org/content/id/4348/cuisenaire.swf

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Development

Be Able To: Connect the new learning to our individual context.

- What are you already doing that you saw modeled today?
- What new learning did you acquire today that you want to ensure that you take back to your team?
- How are you going to ensure that the new learning transfers from conference to practice?